

Abstract

One of the most significant safety concerns in the automation of extracorporeal blood treatments such as dialysis is the risk of blood leakage. Extracorporeal blood treatment systems draw blood at such a high rate that a loss of integrity in the blood circuit can be catastrophic. There are a number of mechanisms for detecting and preventing leaks, but none is perfect. According to the present invention, the probability of a leak, its seriousness, the amount of time the leak condition has persisted without a response, and other factors may be used to control escalation of multiple types of alarms. In a simple embodiment, for example, there may be a staged audio signal that has a certain loudness and tonal quality when a leak is first detected and becomes more conspicuous as time goes by without a reset response from a user.